



U.S. Department of Energy

# Office of Electricity Delivery & Energy Reliability

## Fort Bragg Benefits From Integrated Energy System

The Office of Electricity Delivery and Energy Reliability (OE) supports research into distributed energy systems, including combined heat and power (CHP) systems such as the one installed at Fort Bragg, North Carolina. The Army's Fort Bragg houses 44,000 soldiers from the 82<sup>nd</sup> Airborne Division and the XVIII Airborne Corps, the U.S. Army Special Operations Command, and the U.S. Army Parachute Team and their families. It is also home to an integrated energy system (IES), also known as a CHP system, installed at the Fort Bragg 82<sup>nd</sup> Airborne's central heating plant. The project sponsored by the Department of Energy through the Oak Ridge National Laboratory (ORNL) and implemented by Honeywell provides electrical power, steam for process heating, and chilled water for cooling to serve a number of barracks and buildings on the base.

The IES system at Fort Bragg consists of a 5-megawatt natural gas turbine, a heat recovery steam generator, and a 1,200-ton lithium-bromide/water absorption chiller. The turbine burns natural gas and is also capable of burning fuel oil. The exhaust waste heat from the power generation turbine is channeled to a heat recovery steam generator (HRSG) and to the chiller. The HRSG uses the energy from the hot exhaust to make steam that can be used throughout the 82<sup>nd</sup> Airborne Compound. The chiller also uses a portion of the hot exhaust to produce chilled water. Process steam is used as a heat source for a variety of applications, including heating water for everyday showering and washing. Chilled water is used for air conditioning at the barracks.

The improved efficiency of the Fort Bragg IES system means savings in energy costs as well as precious natural resources and fewer greenhouse gas emissions and pollutants. A typical centralized coal-fired power plant may have an overall efficiency of 35%. The IES system at Fort Bragg was found to have an efficiency of more than 70% during one day of summer operation in a collaborative study undertaken by the North Carolina Solar Center, ORNL, and Honeywell, while a separate system efficiency determination during January to April 2005 was measured at 74%. Because the IES system at Fort Bragg uses natural gas for fuel, it produces no mercury or sulfur dioxide and a minimal amount of nitrous oxides.

Another benefit is the added energy security that the IES system provides. In a time of crisis, the plant can function independently of the power grid. The Fort Bragg IES demonstrates that IES can provide an efficient, economical, and environmentally sound solution as well as improved readiness for our armed forces.

### *OE Mission*

To lead national efforts to modernize the electric grid, enhance the security and reliability of the energy infrastructure, and facilitate recovery from disruptions to the energy supply.

### *Divisions*

- ◆ Infrastructure Security and Energy Restoration
- ◆ Research and Development
- ◆ Permitting, Siting and Analysis

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